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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,618	03/09/2004	Dennis S. Greywall	Greywall 33	1779

46850 7590 08/22/2005

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EXAMINER

STULTZ, JESSICA T

ART UNIT PAPER NUMBER

2873

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/796,618

Applicant(s)

GREYWALL, DENNIS S.

Examiner

Jessica T. Stultz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-21 and 24-31 is/are rejected.
- 7) ☒ Claim(s) 22-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0304,0505.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because it is too long. Specifically, the abstract cannot exceed more than 150 words; therefore it needs to be shortened. Correction is required. See MPEP 37 CFR 1.72.

Election/Restrictions

Applicant's election with traverse of Group Ib, claims 8-31 in the reply filed on July 21, 2005 is acknowledged. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 8, 10-11, 18, and 27-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al.

Regarding claim 8, Brown et al discloses a MEMS device (Sections 60 and 83), comprising: a rotatable mass suspended at a first offset distance from a substrate (Sections 45-51, wherein the mass is top substrate “52” and the substrate is bottom substrate “62”, Figures 3a-b and 4a-b); and an upright spring coupled between the rotatable mass and the substrate (Sections 45-51, wherein the upright springs are “55b”, Figures 3a-b and 4a-b), wherein the upright spring

enables rotation of the mass about a rotation axis offset from the substrate by a distance greater than the first offset distance (Shown in Figures 4a-b).

Regarding claims 10-11, Brown et al further discloses that the spring comprises two segments joined at one end of the spring and disjoint at another end of the spring (Sections 52-53, wherein the springs comprise disjointed segmented portions “75B” and “75C”, Figures 5a-b), wherein one disjoint segment end is coupled to the rotatable mass and the other disjoint segment end is coupled to the substrate (Sections 52-53, wherein the segments are connected to the mass “72” at the top and substrate “82” at the bottom through a solder ball, Figures 5a-b), wherein the spring is adapted to spread the segment ends via a scissor-type motion (Figures 5a-b).

Regarding claim 18, Brown et al further discloses a pair of upright springs, the pair defining the rotation axis (Shown in Figures 3a-b and 4a-b, wherein the device includes at least one pair of springs which define the rotation axis).

Regarding claim 27, Brown et al discloses a MEMS device (Sections 60 and 83), comprising: an upright spring comprises two segments joined at one end of the spring and disjoint at another end of the spring (Sections 52-53, wherein the springs comprise disjointed segmented portions “75B” and “75C”, Figure 5a-b), one disjoint segment end is coupled to the substrate and the other disjoint segment end is coupled to move with respect to the substrate (Sections 52-53, wherein the segments are connected to a movable mass “72” at the top and a substrate “82” at the bottom through a solder ball, Figures 5a-b).

Regarding claim 28, Brown et al further discloses that the spring is positioned with respect to the substrate such that the joined segment ends are at a greater distance from the substrate than the disjoint segment ends (Figures 5a-b).

Regarding claim 29, Brown et al further discloses that the spring is adapted to spread the segment ends via a scissor-type motion (Figures 5a-b).

Regarding claim 30, Brown et al further discloses a rotatable mass suspended at a first offset distance from a substrate (Sections 45-51, wherein the mass is top substrate "52" and the substrate is bottom substrate "62", Figures 3a-b and 4a-b); wherein the disjoint segment end is connected to the mass (Sections 52-53, wherein the springs comprise disjointed segmented portions "75B" and "75C", wherein the segments are connected to the mass "72" at the top and substrate "82" at the bottom through a solder ball, Figures 5a-b), wherein the upright spring enables rotation of the mass about a rotation axis offset from the substrate by a distance greater than the first offset distance (Shown in Figures 4a-b and 5a-b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9, 12-17, 19-21, 24-26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et al in view of Costello et al.

Regarding claims 9, 12-17, and 31 Brown et al discloses a MEMS device as shown above, but does not specifically disclose that the upright spring extends from the substrate through an opening in the structure and beyond the rotatable mass or that a structure, specifically a plate, more specifically a pixel of a segmented mirror, with a rotation axis that lies within a plane of the plate and comprising two parallel plates connected by a link rod, is mounted on the

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rotatable mass and positioned at a second offset distance from the substrate greater than the first offset distance. Costello et al teaches of a MEMS device (Column 1, lines 22-25) wherein an upright spring extends from a substrate to a movable mass through an opening in the structure (Figures 1B-D) and beyond the mass (Column 3, lines 4-44, wherein the springs “158” extend between the substrate and the upper filter “152” which go beyond the mass “162” which is supported by springs “168”, Figures 1C-D), wherein a structure, specifically a plate, more specifically a pixel of a segmented mirror (Column 6, lines 8-16, wherein the filters include mirrors), with a rotation axis that lies within a plane of the plate and comprising two parallel plates connected by a link rod (Figures 1C-D, wherein the plate is upper filter “152” connected to the bottom plate “162” by a link rod “158”), is mounted on the mass at a distance greater than the distance between the substrate and the mass (Shown in Figures 1C-D, wherein the mass is “162” and the structure is “152”) for the purpose of adjusting the filters to allow differing frequencies of wavelengths of light to pass through (Column 3, lines 4-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the MEMS device of Brown et al to further include the upright spring extending from the substrate beyond the rotatable mass and including a structure specifically a plate, more specifically a pixel of a segmented mirror, with a rotation axis that lies within a plane of the plate and comprising two parallel plates connected by a link rod, mounted on the rotatable mass and positioned at a second offset distance from the substrate greater than the first offset distance since Costello et al teaches of a MEMS device wherein an upright spring extends from a substrate to a movable mass and beyond the mass, wherein a structure, specifically a plate, more specifically a pixel of a segmented mirror, with a rotation axis that lies within a plane of the plate

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and comprising two parallel plates connected by a link rod, is mounted on the mass at a distance greater than the distance between the substrate and the for the purpose of adjusting the filters to allow differing frequencies of wavelengths of light to pass through.

Regarding claims 19 and 24-25, Brown et al discloses a MEMS device as shown above, but does not specifically disclose that the mass includes a base and a sub-structure movably coupled to the base or that the mass comprises a motion actuator to translate the sub-structure with respect to the base. Costello et al teaches of a MEMS device (Column 1, lines 22-25) including a movable mass including a base and a sub-structure movably coupled to the base (Shown in Figures 1C-D, wherein the mass is “162” and the sub-structure is “152”) wherein the mass comprises a motion actuator to translate the sub-structure with respect to the base (Column 3, lines 4-44 and Column 6, lines 8-16, wherein the actuator moves the upper and lower filters) for the purpose of adjusting the filters to allow differing frequencies of wavelengths of light to pass through (Column 3, lines 4-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the MEMS device of Brown et al to further include a mass having a base and a sub-structure movably coupled to the base, wherein the mass comprises a motion actuator to translate the sub-structure with respect to the base since Costello et al teaches of a MEMS device including a movable mass including a base and a sub-structure movably coupled to the base wherein the mass comprises a motion actuator to translate the sub-structure with respect to the base for the purpose of adjusting the filters to allow differing frequencies of wavelengths of light to pass through.

Regarding claims 20-21 and 26, Brown et al and Costello et al disclose and teach of a MEMS device as shown above, but do not specifically disclose that the actuator is either a

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fringe-field actuator, an actuator with a movable electrode and a stationary electrode, or a parallel plate actuator. However, it is well known in the art of MEMS devices to have actuators comprising a fringe-field actuator, an actuator with a movable electrode and a stationary electrode, or a parallel plate actuator for the purpose of providing the proper movement of the device based on the size and shape of the movable mass. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the MEMS device of Brown et al and Costello et al to further include an actuator comprising either a fringe-field actuator, an actuator with a movable electrode and a stationary electrode, or a parallel plate actuator since it is well known in the art of MEMS devices to have actuators comprising a fringe-field actuator, an actuator with a movable electrode and a stationary electrode, or a parallel plate actuator for the purpose of providing the proper movement of the device based on the size and shape of the movable mass.

Allowable Subject Matter

Claims 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowable subject matter: none of the prior art alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103.

Regarding claims 22-23, none of the prior art alone or in combination disclose or teach of a MEMS device as shown including a rotatable mass held above a substrate by upright springs, specifically wherein the rotatable mass comprises an outer sub-structure adapted to move with

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respect to the substrate and an inner substructure adapted to move with respect to the outer substructure.

Conclusion


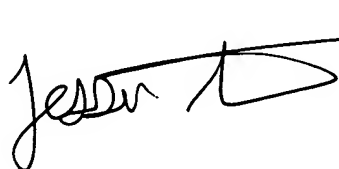
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McNeil et al is cited as having some similar structure to the claimed invention since it discloses a MEMS device including vertical springs and a rotatable mass.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T. Stultz whose telephone number is (571) 272-2339. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jessica Stultz
Patent Examiner
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August 12, 2005



JORDAN SCHWARTZ
PRIMARY EXAMINER